The Pan Pacific Clinical Practice Guideline for the Prevention and Management of Pressure Injury

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Abstract

The Australian Wound Management Association (AWMA), together with international partners in New Zealand, Hong Kong and Singapore, recently presented the *Pan Pacific Clinical Practice Guideline for the Prevention and Management of Pressure Injury* (Guideline) for public consultation. The Guideline, including a companion algorithm, was made available for external review via the AWMA website. The Guideline was developed using a rigorous methodology that focused on reviewing high-level evidence from existing clinical guidelines and systematic reviews. The following paper outlines the development process and discusses key changes to pressure injury (PI) terminology and staging recommended in the Guideline.

Introduction

Numerous recent international guidelines[1-6] have been published for the prevention and/or management of pressure injuries (PIs). These have been developed with varying degrees of rigour and a local region focus. The development of these guidelines highlighted high-level evidence in relation to the most effective prevention and management strategies for these primarily preventable injuries and significant changes in terminology that described and staged PIs. The Australian Wound Management Association (AWMA) published their first *Clinical Practice Guideline for the Prediction and Prevention of Pressure Ulcers* in 2001[7] and an expanded review was required. Over the past five years, the Australian Pressure Ulcer Advisory Panel (APUAP), guided by the AWMA has worked towards the development of a locally relevant, evidence-based framework for the prevention and management of PIs. In 2011 the APUAP teamed with national peak organisations: the New Zealand Wound Care Society, the Hong Kong Enterostomal Therapists Association and the Singapore Nursing Service, Ministry of Health to form a collaborative, international group to develop the *Pan Pacific Clinical Practice Guideline for the Prevention and Management of Pressure Injury* (Guideline). This article will highlight the rigorous process used by the Pressure Injury Guideline Development Steering Committee (PIGDSC) to develop the Guideline and present some of the recommendations included in the Guideline.

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Background

A PI is a "localised injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear and/or friction."[2 p.16] Other contributing factors (for example, impaired mobility, moisture, patient nutrition and skin temperature) are associated with PIs, although their significance currently requires further research. The majority of PIs that occur within the Australian health care setting are stage I or II and are located over the sacrococcygeal region, heels, elbows or malleoli areas[8].

In Australia, estimates of PI prevalence range from 5.6% to 48.4%[9-11] depending on the clinical setting and study methodologies[8]. Estimates of the prevalence of PI in New Zealand have been reported to be 29% in 2003 and 38.5% in 2005, with variation attributable to the clinical setting[8]. In South East Asia, PI prevalence data dates to the 1990s[8]. PI prevalence is reported to range from 9% to 14% in Singaporean

acute and rehabilitation settings, while in 1991 prevalence in Hong Kong rehabilitation settings was estimated to be 21%[8].

PIs present a significant impact on health-related quality of life (HRQOL), including pain, infection and delayed healing[12]. These factors impact upon the general health of patients, and give rise to physical limitations, sleep deprivation and negative psychological outcomes related to mood, body image and coping skills[12]. The development of a PI is often associated with patient anger and blame, particularly when acquired in a health care facility[12]. Management of PIs, including the need for hospitalisation, repositioning and wound dressings, also impacts upon HRQOL and often gives rise to conflict between patients and health professionals[12].

PIs remain prevalent and represent a serious clinical and economic problem[7]. The prevention and effective management of PIs is an imperative to promoting patient health outcomes and improving the allocation of human, economical and temporal international health resources. Clinical guidelines are a strategy associated with improved benefits for patient, clinician and health care systems[13]. However, the development of evidence-based guidelines demands considerable commitment and resources.

The objective in forming a Pan Pacific alliance was to work towards developing international partnerships that would lead to an expanded worldwide consensus for PI guidelines. We could appreciate the value of the partnership between the European Pressure Ulcer Advisory Panel (EPUAP) and National Pressure Ulcer Advisory Panel (NPUAP) that led to the development of their respective guidelines and could foresee similar advantages in establishing collaboration between countries in our region, with the future goal of expanding the partnership on a broader international level. International collaboration was anticipated to reduce the work burden and resources required for the development of the Guideline.

Aims of the Guideline

The Guideline has been developed to increase awareness of PIs amongst Pan Pacific health care professionals and their patients. The primary objectives are to promote the prevention and optimal care of patients at risk of, or with, PIs. The Guideline specifically seeks to assist health professionals to:

- identify patients at risk of PI
- identify strategies to assess PIs and factors related to their risk
- prevent or delay complications associated with PIs
- optimise management of PIs
- optimise quality of life.

In addition, the Guideline aims to present new terminology to describe PIs and a new PI staging system, which aligns with recent evidence and international progress in this field.

Objectives of the Guideline

The focus of the Guideline is to prevent and manage all PIs regardless of stage; however, it excludes mucosal PIs. The objectives of the Guideline were to identify and present the best available evidence underpinning recommendations addressing the following clinical questions:

- What strategies or tools for assessing the risk of PI have been reported in high-level evidence sources and which provide a reliable and valid method of assessing PIs?
- What interventions for preventing PIs have been reported and which are effective in reducing the risk of PI development?
- What strategies or tools for assessing PIs have been reported and which provide a reliable and valid method of assessing PIs?
- What strategies or tools for assessing pain associated with PIs have been reported in high-level evidence sources and which provide a reliable and valid method of assessing pain associated with PIs?
- What interventions for managing pain associated with PIs have been reported in high-level evidence sources and which are effective in managing pain associated with PIs?
- What interventions for treating PIs have been reported in high-level evidence sources and which are effective in promoting healing in PIs?

Scope and audience

The Guideline has been developed for use by multidisciplinary health professionals and is intended for use in all urban, regional, rural and remote areas health care settings of Australia, New Zealand, Hong Kong, Singapore and potential future other Pan Pacific countries. They refer to patients of all ages and may be used as an informative source for consumers and unlicensed carers.

Criteria for considering evidence for the Guideline

Search strategy

An extensive volume of research has been published on the prevention, assessment and management of PIs. It was not feasible for the PIGDSC to appraise all the published literature in the development time frame. Therefore, a methodological strategy that ensured the Guideline and recommendations were informed by the highest levels of evidence was devised. As numerous relevant, international, evidence-based PI

Table 1. NHMRC levels of evidence[14].

Level	Intervention	Diagnosis
I	Evidence obtained from a systematic review of all relevant randomised, controlled trials	A systematic review of level II studies
II	Evidence obtained from at least one properly designed, randomised, controlled trial	A study of test accuracy with independent blinded comparison with a valid reference standard, among consecutive patients with a defined clinical presentation
III-1	Evidence obtained from well-designed, pseudo-randomised, controlled trials (alternate allocation or some other method)	A study of test accuracy with independent blinded comparison with a valid reference standard, among non-consecutive patients with a defined clinical presentation
III-2	Evidence obtained from comparative studies with concurrent controls and allocation not randomised (cohort studies), case-control studies, or interrupted time series with a control group	A comparison with reference standard that does not meet the criteria for level II or level III-1 evidence
III-3	Evidence obtained from comparative studies with historical control, two or more single-arm studies, or interrupted time series without a parallel control group	Diagnostic case-control evidence
IV	Evidence obtained from case series, either post-test or pre-test and post-test	Study of diagnostic yield (no reference standard)

guidelines had recently been developed, the process focused on identifying appropriate existing PI guidelines as well as additional evidence that rated as level one on the National Health and Medical Research Council (NHMRC) evidence scale (Table 1).

A systematic search for English language publications was conducted in the National Guidelines Clearing House, OVID Medline, OVID EMBASE, OVID CINAHL, the Cochrane library, the AWMA journal, and reference lists of included reviews. The database search combined search terms describing PIs using appropriate filters for high-level evidence (Table 2).

Inclusion criteria

Types of evidence

Evidence-based guidelines addressing the focus of the Guideline and published since January 2005 were eligible for appraisal. Systematic reviews (SRs) published between January 1980 to March 2011 were identified for appraisal in the database searches. Systematic reviews and guidelines published between March 2011 and August 2011 (during the Guideline development period) were identified on an ad hoc basis by members of the PIGDSC.

Types of participants

Research conducted in patients either with PIs or considered at risk of developing PIs was considered for inclusion. There were no age restrictions or restrictions to specific clinical settings; however, research on mucosal PIs was excluded.

Types of interventions

Evidence related to PI diagnosis and assessment, PI risk assessment, PI staging scales and assessment of PI pain was considered for inclusion. Evidence on interventions to prevent and/or manage PIs was also considered. Interventions included patient positioning, support surfaces, nutrition, education, health professional education, pharmacological management, complementary and/or alternative treatments, wound management products, hyperbaric oxygen, social/education groups and pain management strategies

Types of outcomes

Outcome measures of interest included various methods of assessing wound response to the intervention such as time to complete wound healing, change in wound size, proportion of PIs healed, and prevention of recurrence (for example, number of new PIs developed in trial period). Other patient outcomes included quality of life, response on global assessments, functional outcomes, pain, compliance with therapy and adverse events.

Study selection and retrieval

Two reviewers assessed titles and available abstracts of all evidence identified in the initial searches. Evidence that potentially met inclusion criteria was retrieved, reviewed and subjected to a critical appraisal.

Table 2. Search strategy for systematic reviews and practice guidelines.

1	exp "Review"/ or exp Guideline/ or exp Practice Guideline/
2	(medline or medlars or embase or pubmed).tw,sh,ab.
3	(scisearch or psychlit or psyclit).ti,ab,sh.
4	cinahl.ti,ab,sh.
5	((hand adj2 search$) or (manual$ adj search$)).tw.
6	((electronic adj database$) or (bibliographic adj database$)).tw.
7	((pooled adj analys$) or pooling).tw.
8	(peto or dersimonian or (fixed adj effect) or mantel haenszel).tw.
9	(psycinfo or psychinfo).ti,ab,sh.
10	exp meta analysis/
11	meta analys$.tw,sh.
12	(systematic$ adj5 review$).tw,sh.
13	(quantitativ$ adj5 review$).tw,sh.
14	(methodologic$ adj5 review$).tw,sh.
15	(quantitativ$ adj5 synthesi$).tw,sh.
16	10 or 11 or 12 or 13 or 14 or 15
17	2 or 3 or 4 or 5 or 6 or 7 or 8 or 9
18	1 and 17
19	pressure ulcer.mp. or decubitus ulcer.mp or exp Pressure Ulcer/
20	pressure injury.mp.
21	19 or 20
22	16 or 18
23	19 or 20
24	22 and 23
25	limit 24 to (English language and humans)

The searches identified 191 SRs and 12 existing clinical guidelines, of which 96 SRs and 12 guidelines were selected for retrieval based on title and abstract. A cursory review of the 12 guidelines indicated only nine were evidence-based and eligible for critical appraisal. The nine guidelines and the 96 SRs were critically appraised, of which four existing guidelines and 44 SRs were selected for inclusion. This review process is documented in Figure 1. Evidence that was not included after the appraisal process is cited, along with the reason for exclusion, in the Guideline.

Evidence appraisal

Existing guidelines and SRs were each appraised by two members of the PIGDSC using the Appraisal of Guidelines for Research and Evaluation (AGREE) instrument (available at http://www.agreecollaboration.org/). Because there were multiple reviewers, a third reviewer appraised all the evidence to ensure internal consistency in the appraisal process. Any discrepancy in appraisal was resolved through discussion between the reviewers.

The AGREE instrument is a recognised appraisal tool that provides a framework for assessing guidelines based on scope and purpose; stakeholder involvement; rigour of development; clarity and presentation; applicability and editorial independence. An overall score for each domain was calculated based on the appraisal. PI guidelines assessed by the PIGDSC are presented in Table 3.

SRs were appraised using critical appraisal tools developed by the Scottish Intercollegiate Guidelines Network (SIGN) (available at www.sign.ac.uk/methodology/checklists.html). This appraisal tool provides a framework for assessing SRs against key indicators of quality including defined clinical objective; rigour of search; methodological rigour and reporting (for example, systematic and transparent process); critical appraisal process; pooling and analysis techniques; and reporting of conflicts of interest. Table 4 outlines critical appraisal results for SRs meeting the inclusion criteria.

Data extraction

One reviewer systematically extracted relevant data from included evidence sources using a tool that combined NHMRC data extraction suggestions[14] with information collected using the appraisal tool. Data from the SRs and existing guidelines was compiled according to the topic (for example, specific intervention) which it informed and presented to the PIGDSC in evidence summaries.

Table 3. AGREE scores of appraised PI guidelines, shaded guidelines were accepted for inclusion in the Pan Pacific Clinical Practice Guideline for the Prevention and Management of Pressure Injury.

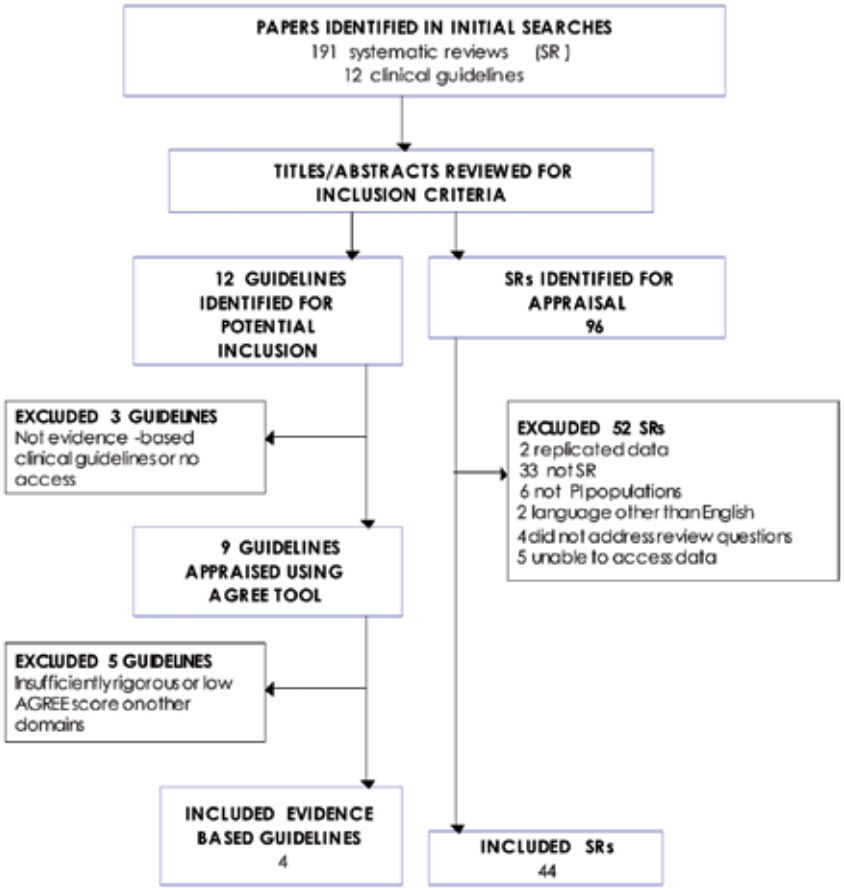
Guideline	Scope & purpose	Stakeholder involvement	Development	Clarity & presentation	Applicability	Editorial independence
NPUAP/EPUAP, 2009[2]	75%	81%	66%	88%	25%	63%
Queensland Health, 2008[3]	29%	56%	28%	25%	25%	25%
Whitney *et al.* 2006[22]	63%	44%	25%	81%	25%	44%
ICSI, 2010[16]	63%	63%	46%	26%	81%	88%
RNAO, 2007[4]	100%	91%	96%	100%	92%	63%
Stechmiller *et al.* 2008[5]	33%	38%	39%	50%	25%	25%
Stockton *et al.* 2009[23]	75%	38%	57%	44%	25%	88%
Dietitians NZ/DAA 2007 & 2011[1,24]	100%	38%	86%	100%	92%	100%
WOCNS, 2010[6]	50%	44%	64%	100%	25%	88%

Development and grading of the recommendations

Development of the recommendations required review of a significant volume of evidence. To achieve this within the Guideline development time frame, Guideline Development Groups (GDGs) were formed to: review the evidence summaries; develop recommendations that reflected the evidence; grade the body of evidence underpinning each recommendation; and develop practice points to assist clinicians to implement the recommendations. Each GDG was chaired by a member of the PIGDSC and consisted of four to six multidisciplinary experts in the field.

The evidence from the SRs and existing clinical guidelines was collated into summaries and a NHMRC body of evidence

Figure 1. Guideline process.



assessment matrix[14] was used to assess the volume and consistency of evidence supporting each recommendation; as well as the clinical impact, generalisability and applicability. A recommendation statement reflecting the evidence for each intervention or topic was developed using a consensus process within the GDGs, overseen by the PIGDSC.

Development of recommendation support material

The Guideline is supported by practice points and an algorithm to assist clinicians in implementing the recommendations.

Most practice points were derived from existing PI guidelines where they were presented as consensus recommendations or practice points. Each GDG discussed the practice points where members provided a rating as to the importance and relevance of each practice point. Where consensus was reached, the practice point was included in the Guideline. Additional practice points developed by the GDG were supported by the level I evidence, manufacturer product information and evidence falling beyond the scope of the literature review (for example, occupational health and safety guidelines).

The algorithm provides a visual flow chart to assist clinicians to implement the Guideline. The algorithm represents a flow of care for prevention and management of PIs, commencing with risk assessment screening and wound assessment (for patients with existing PIs) and progressing through strongly recommended prevention and management strategies.

Limitations of the Guideline and future research focus

The Guideline literature search was not designed to retrieve safety trials for pharmacological interventions and the Guideline does not seek to provide safety and usage guidance for medications, dressings, devices or antiseptic solutions. The selection of these interventions is complex, and should consider the patient's clinical profile, personal preferences and guidance from appropriate sources (for example, the National Prescribing Service, Australian Therapeutic Guidelines or New Zealand Medicines and Medical Devices Safety Authority). Where reported in the reviewed literature, adverse events associated with specific interventions have been included in the Guideline.

Table 4. Critical appraisal of included SRs.

	Primary clinical topic	Focused review question	Methodology reporting	Rigour of search	Critical appraisal	Results pooling	COI and funding reporting
++ well covered + adequately addressed – Poorly or not addressed/not reported N/A not applicable							
Akbari *et al.* 2006[25]	Therapeutic ultrasound	++	++	++	++	++	++
Ankrom *et al.* 2005[26]	Pressure ulcer staging	+	+	++	–	–	–
Aziz *et al.* 2010[27]	Electromagnetic therapy	++	++	++	++	++	++
Bouza *et al.* 2005[28]	Wound care: topical agents and dressings	++	++	+	+	++	+
Bradley *et al.* 1999[29]	Wound care: topical agents and dressings	+	++	++	++	++	++
Cullum *et al.* 2001[30]	Electrotherapy	++	++	++	++	++	++
De Laat *et al.* 2005[31]	Pain, wound exudate	+	+	+	–	–	+
Gardner *et al.* 1999[32]	Electrical stimulation	++	+	+	–	+	+
Gelis *et al.* 2009[33, 34]	Risk factors	++	+	+	+	++	++
Girouard *et al.* 2008[35]	Pain assessment	++	++	++	+	++	–
Gorecki *et al.* 2009[12]	QOL	++	++	++	++	++	++
Gorecki *et al.* 2011[36]	Pain	++	++	++	+	++	++
Gray & Whitney 2003[37]	Nutrition	++	+	++	–	–	–
Gray 2003[38]	Nutrition	++	+	++	N/A	N/A	–
Gray 2003[39]	Nutrition	++	–	++	+	–	–
Gray *et al.* 2006[40]	HBOT	++	–	+	–	N/A	–
Heyneman *et al.* 2008[41]	Wound care: hydrocolloid dressings	+	++	++	+	++	+
Jull *et al.* 2008[42]	Wound care: honey	++	++	++	++	++	++
Junkin & Gray 2009[43]	Pressure redistribution surfaces	++	+	+	–	+	++
Kottner *et al.* 2009[44]	Risk assessment	+	++	++	+	+	++
Kottner *et al.* 2009[45]	PI classification scales	++	++	++	++	++	–
Kottner *et al.* 2011[46]	Risk assessment	++	++	+	++	++	++
Krapfl and Gray, 2008[47]	Repositioning	++	++	++	+	++	–
Langer *et al.* 2003[48]	Nutrition	++	++	++	+	–	++
Legood & McInnes 2005[49]	Cost effectiveness	++	++	++	+	+	++
McGaughey *et al.* 2009[50]	PEMT	++	++	+	++	+	–
McInnes *et al.* 2010[51]	Pressure redistribution surfaces	++	++	++	++	++	++
Michael *et al.* 2007[52]	Seating	+	++	++	+	–	++
Moore & Cowman 2009[53]	Pressure redistribution surfaces	++	++	++	N/A	N/A	++

Table 4 (continued). Critical appraisal of included SRs.

	Primary clinical topic	Focused review question	Methodology reporting	Rigour of search	Critical appraisal	Results pooling	COI and funding reporting
Moore & Cowman 2008[54]	Risk assessment	++	++	++	++	N/A	++
Moore & Cowman 2008[55]	Wound cleansing	++	++	++	++	++	+
Pancorbo-Hidalgo *et al.* 2006[56]	Risk assessment	++	+	++	++	++	+
Pieper *et al.* 2009[57]	Pain	+	–	–	–	+	+
Reddy *et al.* 2008[58]	Support surfaces, wound care, adjunctive therapies	++	++	++	++	++	++
Reddy *et al.* 2006[59]	Prevention interventions	+	++	+	++	+	++
Reenalda *et al.* 2009[60]	Interface pressure	++	++	+	++	++	–
Soban *et al.* 2011[61]	QI initiatives	+	++	++	++	–	+
Stratton *et al.* 2005[62]	Nutrition	++	++	++	+	++	+
Ubbink *et al.* 2008[63]	NPWT	++	++	++	++	++	–
van den Boogaard *et al.* 2008[64]	NPWT	++	+	+	++	+	–
van Lis *et al.* 2009[65]	Assessment	+	+	–	–	++	+
Vermeulen *et al.* 2010[66]	Wound care: iodine	++	++	+	++	++	++
Vikatmaa *et al.* 2008[67]	NPWT	+	++	++	++	+	++
Xie *et al.* 2010[68]	NPWT	++	++	++	+	–	++

For some interventions there was limited high-level evidence from which to draw conclusions on the intervention's effectiveness. Using the NHMRC body of evidence assessment matrix[14] led to a recommendation with a lower grade, indicating reduced confidence in the generalisability of the recommendation. There is a clear need for ongoing research in this field, and the PIGDSC has identified areas where future research could focus, including:

- the importance of extrinsic factors such as moisture to the assessment and management of PIs
- the validity and reliability of non-numerical PI risk assessment scales or algorithms
- the most effective repositioning regimens
- the most effective and cost-effective pressure redistribution support surfaces
- the role of multivitamin and arginine supplementation
- the effectiveness of complementary, traditional and alternative interventions such as hyperbaric oxygen therapy; infrared, light and laser therapies; and Chinese traditional medicine
- the role of topical agents, particularly silver, cadexomer iodine and honey.

An additional limitation to the Guideline is the reported outcome measures of clinical trials. The majority of research on PI treatments reported outcome measures associated with wound healing, for example *time to complete healing*. While healing is the primary aim of many interventions, other beneficial outcomes for both the wound (for example, preparation of the wound bed for other treatments) and the patient (for example, reduction in pain and increase in function) regularly remain unreported. These outcomes are significant in the holistic management of PIs and have been addressed by the GDGs and PIGDSC through consensus recommendations and practice points. The PIGDSC acknowledges that lack of evidence of effect is not evidence of lack of effect and urges future researchers to address outcome measures beyond those associated with wound healing when investigating the prevention and management of PIs.

Some interventions were not supported, or received a lower grade, because high-level research indicated there was a lack

of effect. This refers to lack of evidence of effect over placebo or standard therapy, that is: patients may receive some benefit from the intervention but this does exceed the benefit achieved from either placebo therapy or standard care. The *standard care* used as a comparison in PI research varies, often related to the period of time in which the research was conducted. Comparison treatments generally consisted of basic dressing techniques, regular repositioning and a '*standard*' hospital mattress, details of which are reported throughout the Guideline for individual studies.

New terminology

One of the objectives of the Guideline was to advance the terminology used to describe PIs in Australia and the Pan Pacific. In 2009 Dunk and Arbon[15] argued that the most commonly used terms to describe PI vis-à-vis pressure ulcer, decubitus ulcer, pressure sore and bed sore failed to accurately describe the problem and its causation. International consensus now recognises that PIs are highly preventable[2,4,16-18], with the most recent clinical guidelines having a strong focus on prediction and prevention. With this understanding of the aetiology of PIs, it is time for emergence of accurate terminology that infers the preventable nature of these wounds. Use of the term *injury*, which encompasses wrongful action of a PI and focuses on causation, has the potential to influence the way in which clinicians consider PIs, and highlight the important role of preventative strategies[15].

To this extent, the AWMA conducted an online survey canvassing members of the AWMA, the New Zealand Wound Care Society, the Hong Kong Enterostomal Therapists Association and health professionals employed under the Ministry of Health in Singapore on their preference for the term *pressure ulcer* or *pressure injury*. Over 400 clinicians and academics provided a response, with the overwhelming majority supporting the term pressure injury to describe localised injuries to the skin and/or subcutaneous tissue that occurs as a result of pressure, alone or in combination with other causative factors.

As such, the PIGDSC has adopted this terminology in the publication of Australia's newest PI clinical guideline and challenges international guideline developers to follow this lead.

A new PI staging system

The Guideline recommends adopting a new PI staging system in Australia, New Zealand and the Pan Pacific regions.

PI classification systems provide a consistent and accurate means by which a clinician or researcher can communicate and document the severity of a PI. To date there has been no universally used PI classification system in the Australian health care system. Commonly used staging systems have included the AWMA 2001 classification system[7], the NPUAP[19] and the EPUAP[20] classification systems (both of which

Table 5. Body of evidence assessment matrix[14].

Component	A Excellent	B Good	C Satisfactory	D Poor
Evidence base	Several level I or level II studies with low risk of bias	One or two level II studies with low risk of bias or a SR of multiple level III studies with low risk of bias	Level III studies with low risk of bias or level II studies with moderate risk of bias	Level IV studies or level I to III studies with high risk of bias
Consistency	All studies consistent	Most studies consistent and inconsistencies may be explained	Some inconsistency reflecting genuine uncertainty around clinical question	Evidence is inconsistent
Clinical impact	Very large	Substantial	Moderate	Slight or restricted
Generalisability	Population/s studied in body of evidence are the same as the target population for the Guideline	Population/s studied in the body of evidence are similar to the target population for the Guideline	Population/s studied in the body of evidence different to the target population for the Guideline but it is clinically sensible to apply this evidence to the target population (e.g. results in adults that are clinically sensible to apply to children)	Population/s studied in the body of evidence different to the target population for the Guideline and hard to judge whether it is sensible to generalise to the target population
Applicability*	Directly applicable to Australian health care context	Applicable to Australian health care context with few caveats	Probably applicable to Australian health care context with some caveats	Not applicable to Australian health care context

have been modified numerous times) or, most recently, the NPUAP/EPUAP 2009 staging system[2].

The literature review underpinning the Guideline failed to identify evidence of superior validity or reliability of any single PI classification system. The PIGDSC takes the position that a consistent vocabulary be used worldwide to promote the international dialogue on the prevention and management of PIs. The feedback received in the AWMA 2011 online survey overwhelmingly supported the adoption of the published NPUAP/EPUAP classification system[2].

The NPUAP/EPUAP PI classification system[2] provides the following classifications, each of which is accompanied by a comprehensive description:

- Stage I PI: non-blanchable erythema:

  Intact skin with non-blanchable redness of a localised area usually over a bony prominence. Darkly pigmented skin may not have visible blanching; its colour may differ from the surrounding area. The area may be painful, firm, soft, warmer or cooler compared to adjacent tissue. May be difficult to detect in individuals with dark skin tones, may indicate "at risk" persons (a heralding sign of risk)[2].

- Stage II PI: partial thickness skin loss:

  Partial thickness loss of dermis presenting as a shallow, open wound with a red-pink wound bed, without slough, may also present as an intact or open/ruptured serum-filled blister, presents as a shiny or dry, shallow ulcer without slough or bruising (NB bruising indicates suspected deep tissue injury), stage II PI should not be used to describe skin tears, tape burns, perineal dermatitis, maceration or excoriation[2].

- Stage III PI: full thickness skin loss:

  Full thickness tissue loss. Subcutaneous fat may be visible but bone, tendon or muscle are not exposed. Slough may be present but does not obscure the depth of tissue loss. May include undermining and tunnelling. The depth of a stage III PI varies by anatomical location. The bridge of the nose, ear, occiput and malleolus do not have subcutaneous tissue and stage III PIs can be shallow. In contrast, areas of significant adiposity can develop extremely deep stage III PIs. Bone or tendon is not visible or directly palpable[2].

- Stage IV PI: full thickness tissue loss:

  Full thickness tissue loss with exposed bone, tendon or muscle. Slough or eschar may be present on some parts of the wound bed. The depth of a stage IV pressure injury varies by anatomical location. The bridge of the nose, ear, occiput and malleolus do not have subcutaneous tissue and these PIs can be shallow. Stage IV PIs can extend into muscle and/or supporting structures (for example, fascia, tendon or joint capsule) making osteomyelitis possible. Exposed bone or tendon is visible or directly palpable[2].

- Unstageable PI: depth unknown:

  Full thickness tissue loss in which the base of the PI is covered by slough (yellow, tan, grey, green or brown) and/or eschar (tan, brown or black) in the PI bed. Until enough slough/eschar is removed to expose the base of the PI, the true depth, and therefore the stage, cannot be determined. Stable (dry, adherent, intact without erythema or fluctuance) eschar on the heels serves as the body's natural biological cover and should not be removed[2].

- Suspected deep tissue injury: depth unknown:

  Purple or maroon localised area or discoloured, intact skin or blood-filled blister due to damage of underlying soft tissue from pressure and/or shear. The area may be preceded by tissue that is painful, firm, mushy, boggy, warmer or cooler as compared to adjacent tissue. Deep tissue injury may be difficult to detect in individuals with dark skin tone. Evolution may include a thin blister over a dark wound bed. The PI may further involve and become covered by thin eschar. Evolution may be rapid, exposing additional layers of tissue even with optimal treatment[2].

Previous classification systems have neglected inclusion of a definition of *suspected deep tissue injury* (SDTI)[21] and its introduction into Australian classification terminology is significant. Along with other PIs, SDTIs are cause by sustained pressure and their inclusion in a PI classification system is appropriate. Differentiation from stage I PIs is important, as SDTIs often deteriorate rapidly and resolution is generally slow[21]. Lack of a universal definition and well-used terminology to define and document the injuries has contributed to the lack of reliable data available on their prevalence, incidence and clinical course[21].

Implications of new terminology and staging systems

Adoption of new terminology to describe and categorise PIs is not without implications. One of these is the divergence from terms to describe PIs proscribed in the *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification* (ICD-10-AM), which is used for funding and reporting in Australia, New Zealand and Singapore. To address the anomaly that will arise between clinical documentation and coding terminology, the PIGDSC has commenced negotiations to revise the ICD-10-AM, which currently continues to use the terms *decubitus ulcer* and *pressure area* and provides limited classification options for PI staging.

Consultation

The Guideline was presented for public consultation at the Pan Pacific Venous Leg Ulcer and Pressure Injury Forum in Canberra in October 2011. The PIGDSC posted the Guideline on the AWMA website for two months, and invited members of the public and partner associations to review and comment on the draft version. The Australian public were informed of the draft Guideline and review process via an advertisement in *The Australian* newspaper. Copies of the Guideline were also distributed to nominated individuals and health agencies or authorities with a vested interest in the development of the Guideline.

Following the Guideline review process, the PIGDSC re-formed to analyse the feedback comments and determine the evidence for inclusion or exclusion of any recommendations made.

Conclusion

The final version of the *Pan Pacific Clinical Practice Guideline for the Prevention and Management of Pressure Injury* will be launched at the AWMA Conference in Sydney 18–21 March, 2012. The Guideline will represent the most recent evidence for PI prevention and management. The development has involved a multidisciplinary team of more than 20 health professionals, academics and consumers and has undergone significant consultation with a broader audience. The AWMA intends to develop support materials including an abridged version of the Guideline and a consumer edition.

Adoption of clinical guidelines in the health care setting is associated with consistent best practice health care provision; improved clinical outcomes; quality improvement in health care delivery and improved health professional and patient knowledge. It is hoped that the *Pan Pacific Clinical Practice Guideline for the Prevention and Management of Pressure Injury* will contribute to improved health care and reduced burden of preventable PIs for Australian and Pan Pacific communities.

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